CLAIMS

What is claimed is:

1. A method for improving signal quality within a radio frequency (RF) receiver, said method comprising:

down-converting an image of a desired signal to a baseband signal;

determining an energy of said baseband signal;

in response to a determination that said energy of said baseband signal being equal to or greater than a predetermined threshold, swapping IF for an incoming signal; and

in response to a determination that said energy of said baseband signal being less than said predetermined threshold, maintaining IF for an incoming signal.

2. The method of Claim 1, wherein said method further includes continuing normal signal processing.

3. The method of Claim 1, wherein said down-converting is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

and adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{+j\omega_{IF}t}$$
$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

4. The method of Claim 3, wherein said swapping IF is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{+j\omega_{IF}t}$$
$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

5. The method of Claim 4, wherein said maintaining IF is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

6. The method of Claim 1, wherein said down-converting is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

and adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

7. The method of Claim 6, wherein said swapping IF is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

8. The method of Claim 7, wherein said maintaining IF is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{+j\omega_{IF}t}$$

$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

9. The method of Claim 1, wherein said down-converting is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{-j\omega_{IF}t}$$
$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

and

swapping signals paths of an in-phase IF signal and a quadrature IF signal.

10. The method of Claim 9, wherein said swapping IF is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

maintaining signals paths of said in-phase IF signal and said quadrature IF signal.

11. The method of Claim 10, wherein said maintaining IF is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

swapping signals paths of said in-phase IF signal and said quadrature IF signal.

12. The method of Claim 1, wherein said down-converting is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{+j\omega_{IF}t}$$

$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

and

swapping signals paths of an in-phase IF signal and a quadrature IF signal.

13. The method of Claim 12, wherein said swapping IF is performed by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

maintaining signals paths of said in-phase IF signal and said quadrature IF signal.

14. The method of Claim 13, wherein said maintaining IF is performed by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

swapping signals paths of said in-phase IF signal and said quadrature IF signal.

15. A radio frequency (RF) receiver comprising:

means for down-converting an image of a desired signal to a baseband signal;

means for determining an energy of said baseband signal;

means for swapping IF for an incoming signal, in response to a determination that said energy of said baseband signal being equal to or greater than a predetermined threshold; and

means for maintaining IF for an incoming signal, in response to a determination that said energy of said baseband signal being less than said predetermined threshold.

16. The RF receiver of Claim 15, wherein said means for down-converting performs a down-conversion by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

and adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{+j\omega_{IF}t}$$
$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

17. The RF receiver of Claim 16, wherein said means for swapping IF swaps IF by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{+j\omega_{IF}t}$$
$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

18. The RF receiver of Claim 17, wherein said means for maintaining IF maintains IF by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

19. The RF receiver of Claim 15, wherein said means for down-converting performs a down-conversion by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

and adjusting a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

20. The RF receiver of Claim 19, wherein said means for swapping IF swaps IF by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{-j\omega_{IF}t}$$

$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

21. The RF receiver of Claim 20, wherein said means for maintaining IF maintains IF by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and

$$IFLO(t) = e^{+j\omega_{IF}t}$$

$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

22. The RF receiver of Claim 15, wherein said means for down-converting performs a down-conversion by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

adjusts a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{-j\omega_{IF}t}$$
$$where\ e^{-j\omega_{IF}t} = Cos\omega_{IF}t - jSin\omega_{IF}t$$
$$\omega_{IF} = 2\pi f_{IF}$$

and swaps signals paths of an in-phase IF signal and a quadrature IF signal.

23. The RF receiver of Claim 22, wherein said means for swapping IF swaps IF by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and maintains signals paths of said in-phase IF signal and said quadrature IF signal.

24. The RF receiver of Claim 23, wherein said means for maintaining IF maintains IF by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and swaps signals paths of said in-phase IF signal and said quadrature IF signal.

25. The RF receiver of Claim 15, wherein said means for down-converting performs a down-conversion by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = an oscillation frequency of a local oscillator within said RF receiver

f_{CH} = a channel frequency within said RF receiver

f_{IF} = an IF signal frequency within said RF receiver

adjusts a digital complex sinusoid signal within an intermediate frequency local oscillator (IFLO) by

$$IFLO(t) = e^{+j\omega_{IF}t}$$

$$where\ e^{+j\omega_{IF}t} = Cos\omega_{IF}t + jSin\omega_{IF}t$$

$$\omega_{IF} = 2\pi f_{IF}$$

and swaps signals paths of an in-phase IF signal and a quadrature IF signal.

26. The RF receiver of Claim 25, wherein said means for swapping IF swaps IF by

$$f_{RFLO} = f_{CH} - f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and maintains signals paths of said in-phase IF signal and said quadrature IF signal.

27. The RF receiver of Claim 26, wherein said means for maintaining IF maintains IF by

$$f_{RFLO} = f_{CH} + f_{IF}$$

where f_{RFLO} = said local oscillation frequency

f_{CH} = said channel frequency

f_{IF} = said IF signal frequency

and swaps signals paths of said in-phase IF signal and said quadrature IF signal.